This is a working draft which contains contributions from a number of sources that have yet to be acknowledged. It is for comments to Peter Brown peter.g.brown@mcgill.ca; but not for circulation.

Summary and Conclusion: Flourishing in the Anthropocene

"We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations."

Some Grounds of Optimism

One of the unanswered questions in this report is how the proposed massive changes in economic, financial, legal and governmental systems and ethics could occur during the relatively short timeframe in which it will be possible to effectively mitigate the environmental impacts of global warming and address other menacing environmental problems. It is the hope of the authors of this report that these changes will occur quickly with minimal confusion and conflict. However, we are very much aware that the prospects that this could happen in the present geopolitical climate are remote. But we are also convinced that this political climate will change dramatically over the next few years in ways that will greatly enhance the prospects that they could occur.

Research based on nonlinear systems theory has revealed that during periods of gradual change, negative feedbacks maintain societal systems in relative states of equilibrium and radical changes in these systems rarely occur. But during periods of rapid change, a crisis results in positive feedbacks that move societal systems toward states which are far from equilibrium, and these feedbacks increase in almost direct proportion to the numbers of people who are aware of and concerned about the crisis. When this occurs in democratic societies, large numbers of previously apathetic people are increasingly willing to question and abandon shared ideas and assumptions which had previously been perceived as taken-for-granted aspects of

reality, and radical changes in societal systems tend to occur over a relatively short period of time.[i]

It seems clear our view that the far from equilibrium conditions in which the massive changes in our political and economic institutions required to address the environmental crisis could occur will result from the escalating environmental impacts of global warming. These impacts will likely include food and water shortages, rising sea levels, and dramatic increases in the frequency and severity of hurricanes, typhoons, draughts and floods. The unfortunate result will be dramatic increases in the numbers of people who do not have access to adequate supplies of food and potable water, the rapid spread in these populations of communicable diseases, cross border conflicts that could escalate into wars of aggression, and massive disruptions in systems of production, exchange and finance in the global market system.

It also seems likely in our view that the initial response of governments of developed countries will be to close their borders to prevent an influx of unwanted immigrants and to use their economic prowess and military might to secure the resources required to sustain their national economies. But as the environmental impacts of global warming continue to escalate, these negative feedbacks will not be able to maintain societal systems in relative states of equilibrium and these systems will move toward states which are far from equilibrium. In the absence of a willingness to implement public policies and economic programs which are commensurate with the terms of human survival in the age of the Anthropocene, these far from equilibrium conditions could quickly result in the breakdown of these systems. If we are to prevent this breakdown, it will be necessary to make the massive changes in our economic, financial, legal, governance,and ethical systems required confront the challenges of the Anthropocene. The following list of proposed changes in these systems is consistent with and informed by the ethical principles in the Earth Charter and the quotations that accompany these descriptions are from this document.

Here is What Must Be Done

EARTH OUR HOME

"The protection of Earth's vitality, diversity, and beauty is a sacred trust." The Earth Charter

We must embrace compassionate retreat. The human project and presence has become too large and grotesquely unfair. We must learn to live within Earth's limit and the share it's fruits and those of human ingenuity with our fellow humans and the rest of the life with which we share heritage and destiny. As members of the life's community there is a duty to restore and regenerate life's household; and where possible restore low entropy sources and cleanse congested sinks. As is the case in a battle that cannot be won we must retreat while limiting the harm to the most vulnerable members of life's commonwealth. High finance in particular, symbolically and literally at the front line of this doomed battle, can and must embrace a humble retreat.

Economics, Finance, and Governance must be grounded in Earth System Science and a Holistic Ethic. Institutions of economics, finance and governance must themselves be governed by individuals literate in science; and committed to holistic ethical principles such as those found in

the Earth Charter. All universities and colleges must urgently reconstitute their instruction in these subjects according to the same two criteria; and new programs must be founded on these principles. We call upon the philanthropic community and individuals alike to stop all donations to institutions that do not take these steps.

THE GLOBAL SITUATION AND THE CHALLENGES AHEAD.

"The foundations of global security threatened. These trends are perilous—but not inevitable."

"Our environmental, economic, political, social, and spiritual challenges are interconnected, and together we can forge inclusive solutions." The Earth Charter

We take our bearings and guide our actions on the basis of the ideas of neo-classical economics, finance, law and sovereign nation states, and ethics. Yet, each of these systems of thought rest on assumptions that ignore, and indeed are strongly at variance with, the scientific discoveries of the last two hundred years. Like "orphans" these ways of thinking remain alive; even though their parents—the assumptions about the universe and the human place in it from which they arose, principally from the European Enlightenment of the 17th and 18th centuries —have been eclipsed.

In what follows we begin by summarizing many of the major problems with each of these systems of thought which emerged in the Holocene; and then contrast them with the a characterization of what is needed for the Anthropocene.

1) The Economic System

There is no basis in the neoclassical economic paradigm for even recognizing that the "real" economy is made up of energy and material flows that obey the laws of physics, chemistry and biology. This paradigm counsels and promotes exponential growth despite overwhelming scientific evidence that this is a program for ecological disaster. Equally problematic, the primary beneficiaries of this growth have been the roughly 20% of the global human populations living in developed countries while over 50% of this population continues to live under conditions of extreme poverty. Economic growth in some developing countries like China and India has resulted in dramatic improvements in standards of living for a small percentage of the population living in these countries. But the price that has been paid for this growth is the fossil fuel based production and distribution systems in these countries is dramatic increases in their emissions of carbon dioxide. Even more invidious, the absurd assumption in the neoclassical economic growth paradigm that the resources of nature are inexhaustible has resulted in the wholesale destruction of environmental systems that support human life. And last but certainly not least, it has also resulted in the greatest mass extinction of life on Earth since a six-mile wide asteroid brought an end to the age of the dinosaurs sixty five million years ago.

If we are to coordinate global economic activities within the safe operating zone defined by the planetary boundary conditions, this will require the rapid implementation and widespread use of a new model for macroeconomics. This model will include the key macroeconomic variables of consumption, government spending, investment, employment, and trade. But these variables will be configured in ways that privilege a balance between consumption and investment and the contributions that could be made to the resolution of environmental problems by public,

community and private sectors. It would also be based on a different conception of productivity growth and the conditions required for profitability. This model would also include new macro-economic variables on energy and resource dependency, limits on emissions of carbon dioxide, the nature of ecosystem functions, and accounting for low entropy sources and their respective sinks.

In the existing macroeconomic models, investment stimulates consumption growth, profits increase as a result of productivity improvement. and consumer markets perpetually expand. But in the real economy in the age of Antropocene, investment must be focused on the long-term protection of the assets on which basic economic services depend. And the new targets of investment will be low-carbon technologies and infrastructures, resource productivity improvements, the protection and regeneration of ecological functions, maintaining public spaces, and building and enhancing human well-being. In the new macroeconomic model, long-term security will have more weight than short-term financial gain, and social and ecological returns on investment will be as important as conventional financial returns. And one of the core principles in this model is that capital markets must be reformed and legislation must be passed that prevents destabilising financial practices like those which caused the virtual meltdown of the global financial system in December 2008.

The new macroeconomics model will also be ecologically and socially literate and will not be based on the absurd assumption that the economy operates in a domain separate from the larger society. This will require a new accounting system that will take into account measures of human well being and happiness which are conspicuously missing in the GNP system. This new model would also be capable of simulating the complex interactions between economic, financial and ecological variables and would include relevant financial, economic and ecological data. And it would also provide a coherent basis for implementing public policies and economic programs that increase employment, maintain economic stability, preserve and protect natural resources, reduce resource consumption to remain within the limits of planetary boundaries, and meet the demands of social and ecological justice.

2) ***The New Financial System***

Money and Investment for a Finite Planet. *The primary justification for creating and maintaining the complex global financial system is that it promotes the efficient growth and expansion of the global economy, thereby delivering growing prosperity to humanity in the process. In fact, the debt based financial system is predicated on the assumption in neoclassical economic theory that there are no limits to economic growth, as scarcity promotes substitution and innovation. The authors of this report reject the validity of this perpetual growth assumption.*

The recent near collapse of the financial system and the ongoing crisis now centered in Europe suggests there are fundamental design flaws in the architecture of the financial system, exacerbating the well critiqued moral deficiencies of its actors and leaders. What was believed to promote greater efficiency, growth and prosperity has degenerated into a speculative casino in a highly complex, highly leveraged, predatory and often fraudulent and violent risk valuation and transfer game disconnected with the needs of the real economy, yet creating shock waves that have been catastrophic to the real economy and wasteful to our increasingly fragile ecosystem in the process.

The mainstream critique of the financial system centers around flawed regulatory oversight needed to reign in human greed and hubris in order to control firm level and systemic risk, while defenders of the system warn that the cure could be worse than the disease. Both sides of the argument fail to acknowledge that these problems result from fundamental and pernicious design flaws in neoclassical economic theory which are predicted on the assumption that exponential material growth is possible and desirable on a finite planet with limited resources. The challenge here is not merely to establish new rules and regulatory agencies to deal with the problems of too big to fail multi trillion dollar financial behemoths and to put in end to the illegal, immoral and predatory behaviour on Wall Street. It is also to reconnect the practice of finance to the social systems it is intended to support and create a financial system which operates within the finite boundaries of the biophysical systems upon which all life depends. And accomplishing the feat will require a fresh inquiry and holistic understanding of all the core functions of finance.

Nothing is more important in finance, at this time, than the flow of real investment, the first function of finance. It is the bridge to the economic system of the future and the steering wheel that determines the course to get there. In the new global financial system, both the quality and quantity of real investment will be a product of the design of this system. For example, the quality of real investment will determine what type of energy and transportation systems we will have in the future. The quantity of investment presents an uncomfortable challenge, for if there are limits to growth, and investment drives growth, then it stands to reason that there must be limits to investment. There must also be lower limits to debt capacity than in the perpetual growth paradigm.

Shifting from a world in which the flow of investment is an accepted right of the owners of capital in the so called free market, to a world where the quality and quantity of real investment becomes a decision of vital public interest to all of humanity is staggering to contemplate. Making such decisions democratically in a timeframe that matters will be enormously difficult and very challenging. If we are to effectively deal with this problem, policy makers and those presently in control of the aggregate capital investment process, a tiny minority of the human population, must realize that business as usual in the existing global financial system is a program for ecological disaster and get down to the business of creating a system that is commensurate with the terms of human survival in the age of the Anthropocene. And they must also realize that this will require a holistic decision making process which recognizes the connection between real investment decisions and the social and ecological impacts of this investment in the real world.

3) The New System of Government and Environmental Law

The present system of government is predicated on the construct of the sovereign nation-state and it is assumed that each of these states is empowered to manage their economies and create financial policies which serve their perceived vested interests. But in the real world, these economies are embedded in a global economic system and the economic activities in this system are in the process of undermining the capacity of the biosphere to support life. It is also assumed that sovereign nation-states can determine which environmental laws are implemented within the territories governed by these states and how these laws will be enforced. The obvious problem here is that there are no boundaries between sovereign nation states in real world and

human and environmental systems are embedded in and interactive with one another in this world on the local, regional and global levels.

Equally problematic, the only source of political power in the existing system of international government, the United Nations, is the sovereign nation-state and there is no basis in this system for implementing viable solutions for problems in the global environment. The inconvenient truth here is that the environmental crisis cannot be resolved in the absence of more effective institutions of global governance.[1] We realize that creating such institutions is fraught with dangers. On the other hand, there is no basis in the current system for preventing an ecological catastrophe and it legitimates unconscionable inequality and deprivation. Environmental law in existing systems of government is predicated for the most part on the construct of private poverty, privileges economic interests over ecological concerns, and does not take into account the aggregate scale of human impacts on environmental systems. If we are to resolve the environmental crisis, it will be necessary to create international environmental laws and the associated legislative, administrative and judicial systems which have the means to perform the following functions: 1) enforce the rules and regulations associated with the environmental laws in a fair and equitable way; 2) monitor the impacts of human activities on the environmental systems protected by the environmental laws; and 3) conduct independent judicial oversight to ensure compliance with these laws.

UNIVERSAL RESPONSIBILITY

"The spirit of human solidarity and kinship with all life is strengthened is strengthened when we live with reverence for the mystery of being, gratitude for the gift of life, and humility regarding the human place in nature." The Earth Charter

The ethical standards for moral behavior and decision making in highly industrialized Western countries are predicated on conceptions of human origins and our privileged place and importance in the universe which are no longer commensurate with the terms of human survival. We now know that the assumption that the natural world was created for our use and benefit and that the resources of nature are inexhaustible is dangerously wrong. The ethical standards which will allow us to live on a flourishing Earth in the age of the Anthropocence are very different and can be briefly stated as follows: 1) persons are fundamentally interdependent members of communities that include humans and other life; 2) we have a fundamental duty and moral responsibility to preserve, protect and care for the natural environments in which all human beings and other life forms exist; and 3)this will require care for the low entropy sources and sinks for the disposal of their wastes. We call these, respectively, membership, householding, and entropic thrift. Living in keeping with these three premsies may be summarized as living in the right relationship with life and the world.

A. Membership: Recognition that we share heritage and destiny with all other people and all other life on this planet, as well as the dependence of life on physical chemical, and biological evolution, must lead us to *expand the moral community to include all persons and all life.* The attitude of domination of the world and its peoples must be replaced with *respect and reciprocity* toward *all that is*. Individualism must give way to holism. We *are members of, not*

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[1] Other provocative suggestions about global governance and now to get there are George Monbiot's *The Age of Consent;* and Adi Da's *Not-To Is Peace.*

masters over, life's commonwealth. All persons in all cultures have equal moral claims to flourishing, constrained and enhanced by the claims of other species for their place in the sun. The human claim to nobility rests on using our ability to foresee the future to enable its flourshing.

B. House-holding: When humans see themselves as intrinscially members of communities, care for those communities is simply an expression of who we are and what we do. *The idea of the Earth as a collection of resources and waste receptacles must give way to that of the Earth as life's household ("oikos" – the root of economics and ecology).* Earth is the home to life's commonwealth where all species interact with each other and the planet's biogeophysical systems. It is our calling to facilitate the thriving of life to continue on its metaphysical journey into novelty.

C. Entropic Thrift: ***Low entropy stocks and flows and the sinks for high entropy waste must be used judiciously and with respect.*** Like all other far from equilibrium systems, our lives depend on low entropy. Broadly defined, low entropy energy is a fundamental good that underlies all other "goods." It enables the far from equilibrium, autocatalytic living organisms like us to exist and thrive. Wasting that which makes life itself possible is a fundamental moral wrong. *The Earth's limited capacity to construct and maintain far from equilibrium systems implies strong moral limits to human appropriation of low entropy energy and material and of sinks for human waste.*

"Progress" today, which tends to be understood as increased consumption by a massive and growing human population, is now in the process of devouring its own possibility. Once we recognize the evolutionary—complex systems worldview we are offered a different over-arching ethos. Its framing metaphor is "right relationship:" respect for, and reciprocity with life's commonwealth. This involves an end to slavery, an end to the tyranny of the market over humanity and nature alike, and the celebration of our citizenship in a universe ever evolving into novelty. In short, good house holding; or better yet, Earth Citizenship.

Here is How to Do It.

Making the Most of Discontent. How does such change actually occur? We see four essential steps. First, there must be **leaders** that lead according to the needs of the networks in which they are stationed, as opposed to a dictatorial order serving the interests of the powerful. Rain or snow is made possible by dust particles around which moisture accumulates; and when as change in temperature changes precipitation can occurs. This process is called nucleation—the formation of a self-organizing entity around the dust. This report is designed to do this. We aim to provide a remedial focus for the discontent now sweeping the world; from the occupy movements, those oppressed by dictatorships, those whose lives are wracked by crushing poverty, and the middle class that has been ravaged by the economic crisis.

Second, we must recognize the impotence of those in power. Spheres of influence within a culture are stratified into gradations of prestige or status. It is possible to identify the institutions, groups and even individuals located in the nucleus of cultural prestige and therefore influence - think specific universities, media sources, industry associations, corporate leaders, think tanks, religious leaders, and certain public figures. Around that nucleus is a larger

centre with a greater number of 'members, but with relatively less influence than those in the nucleus. Such status gradations ripple outward to the outermost periphery of the culture, something like a dartboard. Because cultural change proceeds from challenges to the legitimacy of the ideas and 'moral systems' of the 'culture's leading gatekeepers' located in the nucleus, the impetus for change virtually never comes from the nucleus. Instead it comes from groups and individuals situated around it and emanates outward to the general population. Ultimately the goal is to redefine the dominant ideas and operations of the centre but that occurs as a result of broader penetration throughout the culture which has the effect of increasing the influence and prestige of the new leaders.

Third, there is power in matrices. The key is to build dense networks in overlapping social and cultural spheres that work together for common cause for a sustained period measured in decades, not years. "When cultural and symbolic capital overlap with social capital and economic capital and, in time, political capital, and these various resources are directed towards shared ends, the world, indeed, changes."[ii] It is precisely such dense networks - deliberately constructed - that propelled the 'neoliberal turn' in Western nation-states.

Many factors mitigate against the development of dense overlapping networks that might similarly propel a counter 'ecological-ethical turn', the most significant being the failure, so far, of progressive thinkers across civil society to identify a common cause. Progressive social movements are fragmented if not competitive, even antagonistic. All, or nearly all, the elements are there but they are not yet networked in a way that exerts the degree of influence commensurate with the change that is needed. This situation makes the need for a new integrative counter-discourse around which all progressive change agents can coalesce, all the more urgent.

Fourth, we must be prepared for struggle. Structural change occurs when the dominant paradigm is delegitimized either in the wake of systemic crises and the rising influence of a challenging paradigm. Vested interests will defend their ideological and institutional terrain against challengers. Abolitionist Frederick Douglass warns against shrinking from the struggle: "Power concedes nothing without a demand. It never has and it never will. If there is no struggle, there is no progress. Those who profess to favour freedom yet depreciate agitation, are men who want rain without thunder. They want the ocean without the awful roar of its many waters…. It is not light we need, but fire; it is not the gentle shower, but thunder. We need the storm, the whirlwind, and the earthquake."[iii]

A DIFFERENT OR ADDITIONAL CLOSING PARA MY BE NEEDED—SUGGESTIONS REQUESTED.

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[i] Frank R. Baumgartner and Bryan D. Jones, *Agenda and Instability in American Politics* (Chicago: University of Chicago Press, 1993).

[ii] Hunter, p. 43

[iii] Internet source - get URL